

AMENDMENT UNDER 37 C.F.R. § 1.116

U.S. Application No.: 10/510,684

Attorney Docket No.: Q83593

REMARKS

Claims 1, 3-5, 7-14 and 19-35 are all the claims pending in the application. Claims 2, 6 and 15-18 have been deleted. Claim 1 has been amended to delete the feature of a hydrocarbyloxysilane compound represented by Formula (III). Claims 7 and 10 have been amended to correct their dependency from cancelled Claims 6 and 2, respectively, to Claim 1. Claim 7 has also been amended to correct a minor informality.

New Claims 22-35 have been added. Support for Claims 22 and 29 can be found in the specification at, for example, page 11, line 14 to page 12, line 16. Support for Claims 23 and 32 can be found at, for instance, Production Examples 9 and 12, and Table 1. Support for new Claim 25 can be found in Claim 1 and Claim 15 (now cancelled). Support for Claims 26, 27 and 28 can be found in Claims 4, 10 and 11, respectively, and support for Claims 30 and 31 can be found in Claims 8 and 9, respectively. Also, support for new Claims 33, 34 and 35 can be found in Claims 19, 20 and 21, respectively. Thus, no new matter has been added.

Claim Rejections Under 35 U.S.C. § 112

Referring to pages 2-3 of the Office Action, Claims 7 and 10 have been rejected under 35 U.S.C. 112, second paragraph. Specifically, Claims 7 and 10 have been rejected as depending from cancelled Claims 6 and 2, respectively.

As discussed above, Claims 7 and 10 have been amended to correct their dependency from cancelled Claims 6 and 2, respectively, to Claim 1. Accordingly, withdrawal of the rejection is respectfully requested.

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Double Patenting Rejection

Referring to page 3 of the Office Action, Claims 1, 5 and 7-9 have been provisionally rejected under the doctrine of double patenting over Claims 10-12 of co-pending Application No. 10/497,462 (“the ‘462 Application”).

Applicants submit herewith a terminal disclaimer directed to the claims issuing from the co-pending ‘462 Application. Thus, withdrawal of this rejection is respectfully requested.

Claim Rejections - 35 U.S.C. §§ 102 and 103

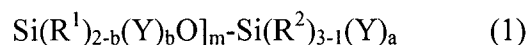
A. Nakagawa

Referring to page 3, paragraph 6 of the Office Action, Claims 12 and 14 have been rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by, and Claims 13 and 19-20 have been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 6,274,688 to Nakagawa (“Nakagawa”). Applicants traverse for the following reasons.

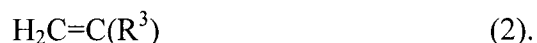
The modified polymer of Claim 12 is made by the process of anionic polymerization using an alkaline metal compound and/or an alkaline earth metal compound as a polymerization initiator and obtained by homopolymerizing a conjugated diene compound or copolymerizing a conjugated diene compound with at least one additional monomer. Unlike the polymer recited in the present claimed invention, the acrylate polymers of Nakagawa are produced by living radical polymerization. See Nakagawa at column 3, lines 38-43. Acrylate polymers produced by living radical polymerization do not teach or suggest modified polymers produced by anionic polymerization, as recited in the claims of the present invention.

Moreover, the claims of the present invention are directed to a method for producing a polymer modified by a hydrocarbyloxysilane compound, represented by Formula (I) and (II).

Nakagawa discloses a crosslinking silyl group of the general formula (1) shown below:



and an alkenyl group of the general formula (2) shown below or a hydroxyl group:



The general formulae (1) and (2) disclosed in Nakagawa, do not teach or suggest a polymer modified by a hydrocarbyloxysilane compound, as recited in Claims 12-14 and 19-20 of the present invention.

Further, a modified polymer recited in the claims of the present invention enhances interaction to both of silica and carbon black. See page 26, lines 4-9 of the present specification. Nakagawa is silent on not only the incorporation of both silica and carbon black into a rubber composition but also the interaction between a modified polymer and with both silica and carbon black.

In view of the above, it is submitted that Claims 12-14 and 19-20 are patentable over Nakagawa. Accordingly, withdrawal of the rejections of the claims under §§102 and 103 over Nakagawa are respectfully requested.

B. JP '906

At page 5 of the Office Action, Claims 1-12 and 14 have been rejected under 35 U.S.C. §102(b) as allegedly being anticipated by JP 56-104906 ("JP '906"). Claims 13 and 19-21 have

been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over JP '906. Applicants traverse for the following reasons.

Applicants submit herewith an English translation of JP '906, for the Examiner's consideration.

JP '906 discloses processes for producing silane modified polymers produced by anionic polymerization using an alkaline metal compound and/or an alkaline earth metal compound as a polymerization initiator and a silane compound of the formula $\text{SiX}_n\text{Y}_m\text{R}_{4-n-m}$, wherein X is a halogen atom, Y is a hydrolysable group other than a halogen, R is alkyl, aryl, vinyl or halogenated alkyl group, n is 0 or 1, m is an integer of 1-4 providing that n+m is at least 2 or greater. JP '906 discloses the following as suitable silane compounds: tetraethoxysilane, triethoxy monochlorosilane, diethoxy monochloromonomethylsilane, triethoxy monomethylsilane, trimethoxy monomethylsilane, diethoxy dimethylsilane, dimethoxy dimethylsilane, dimethyl diacetoxysilane, methyltriacetoxysilane, chloromethyl triethoxysilane, and 3-chloropropyl triethoxysilane.

As discussed above, the present invention is directed to the process for producing a polymer modified by a hydrocarbyloxysilane compound represented by Formulae (I) and (II). The disclosure in JP '906 of the formula $\text{SiX}_n\text{Y}_m\text{R}_{4-n-m}$ does not teach or suggest the modified polymer represented by Formulae (I) and (II) as presently claimed. Accordingly, JP '906 fails to teach or suggest such a modified polymer as recited in the claims of the present invention.

Applicants refer the Examiner to Production Example 8-12 in Table 3 of the present specification. Examples 2-5, which use polymers of Production Examples 9-12, exhibit lower

heat buildup property and better abrasion resistance than those of Example 1, which uses a polymer of Production Example 1, which is modified by tetraethoxysilane (as disclosed in JP ‘906).

Further a modified polymer obtained by the claims of the present invention enhances interaction to both of silica and carbon black. JP ‘906 is silent on not only the incorporation of both of silica and carbon black into a rubber composition but also the interaction between a modified polymer with both silica and carbon black.

Accordingly, the silane modified polymer disclosed in JP ‘906 fails to anticipate or render obvious the hydrocarbyloxysilane compound recited in Claims 1-14 and 19-21 of the present invention.

Thus, withdrawal of the rejections of Claims 1-14 and 19-21 are respectfully requested.

C. JP ‘998

Referring to page 5 of the Office Action, Claims 12 and 14 have been rejected under §102(b) as allegedly being anticipated by JP 2000-086998 (“JP ‘998”). Claims 13 and 19-20 have been rejected under §103(a) as allegedly being unpatentable over JP ‘998. Applicants traverse for the following reasons.

JP ‘998 is directed to a reactive hot melt adhesive having thermal stability, especially excellent viscosity stability, when heated, capable of being set to an arbitrary reaction rate, capable of thermally actively adhering at low temperature, and having good heat resistance by using a vinylic polymer having specific crosslinking groups as a main component. This reactive hot melt adhesive contains a vinylic polymer having a crosslinking silyl group of the formula

$[\text{Si}(\text{R}^1)_{2-b}(\text{Y})_b\text{O}]_m\text{-Si}(\text{R}^2)_{3a}(\text{Y})_a$ (where R_1 and R_2 are each a 1-20 carbon alkyl, a 6-20 carbon aryl or the like; Y is a hydroxyl group or a hydrolysable group; (a) is 0-3; (b) is 0-2; (m) is 0-19, provided that $(a) + (m)(b) \geq 1$) as a main component. *See* Abstract. The vinylic polymer is preferably a (meth)acrylic polymer obtained using a (meth)acrylic monomer as a monomer constituting the main chain in an amount of ≥ 40 wt.%. The vinylic polymer is preferably obtained, for example, by reacting an alkenyl-containing compound with a vinylic polymer obtained by a living radical polymerization method and subsequently reacting the obtained terminal alkenyl-containing vinylic polymer with a hydrosilane compound having the above crosslinking group.

As discussed above, the present invention recites a modified polymer produced by anionic polymerization. The living radical polymerization method disclosed by JP '998 fails to anticipate or render obvious a polymer produced by anionic polymerization and modified by the hydrocarbyloxysilane compound recited in the claims of the present invention. Moreover, JP '998 is silent as to the incorporation of carbon black into a rubber composition, and also fails to disclose the interaction between a modified polymer and carbon black.

Therefore, in light of the above, withdrawal of the rejections of Claims 12-14 and 19-20 under §§102 and 103 over JP '998 is respectfully requested.

D. Haynes, Ozawa, Takeishi, Hogan, Morita, Takeichi '295, Ishikawa

Claims 1, 3-5, 7-14 and 19-21 have been rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over U.S. Patent No. 4,379,891 (EP 067 468) to Haynes ("Haynes") in view of U.S. Patent No. 6,191,247 to Ishikawa ("Ishikawa"); over U.S. Patent No. 6,992,147 (WO 01/34658)

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to Ozawa (“Ozawa”), optionally in view of Ishikawa; over U.S. Patent No. 6,228,908 to Takeishi (“Takeishi”) in view of Ishikawa; over Hogan (US 6,573,412) in view of Ishikawa; over Morita (US 6,369,167) in view of Ishikawa; and over Takeichi ‘295 (US 6,008,295) in view of Ishikawa.

Ishikawa discloses a polysiloxane composition which is blended into the rubber composition in a dry mixing stage for the rubber composition but does not incorporate the polysiloxane into a polymer in a reaction system for modifying the polymer. Moreover, the polysiloxane composition disclosed in Ishikawa is completely different from, and fails to anticipate or render obvious, the method for producing the hydrocarbyloxysilane compounds represented by Formula (I) and (II) as recited in the claims of the present invention.

Moreover, the modified polymer of the present invention exhibits lower heat buildup property and better abrasion resistance in not only a rubber composition which contains silica but also a rubber composition which contains carbon black. These advantages are neither disclosed or suggested to in Ishikawa.

Accordingly, the fact that Ishikawa discloses that the silane condensation catalyst is blended in a dry mixing stage for the rubber composition does not make up for the deficiency of failing to incorporate the polysiloxane into a polymer in a reaction system for modifying the polymer.

Therefore, in view of the above, Ishikawa fails to render obvious the present invention, either alone or in combination with the other cited prior art references. Accordingly, withdrawal of the rejections under § 103 is respectfully requested.

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In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



Kim E. Choate
Registration No. 57,102

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE

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